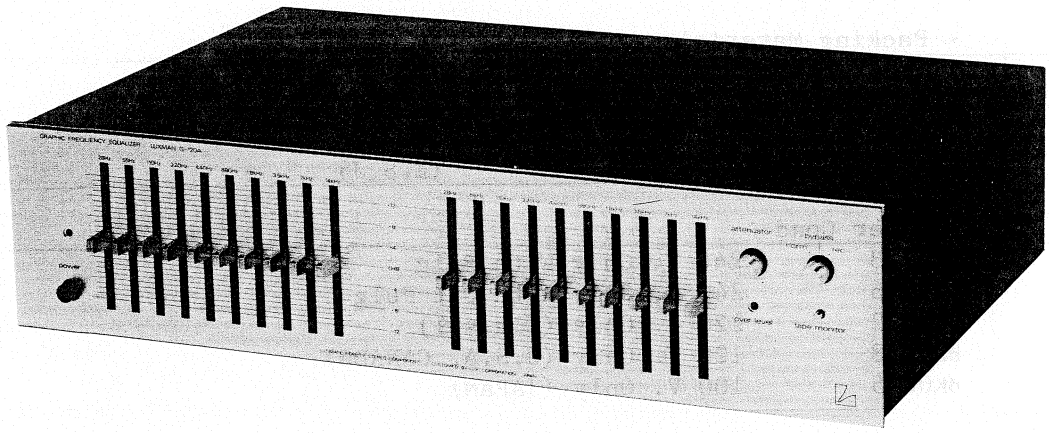
SERVICE MANUAL

GRAPHIC FREQUENCY EQUALIZER G-120A



REF. NO.	STOCK NO.	DESCRIPTION	
	< Knob >		
1	WH1102	Knob (Input Att., Function SW.)	(J,U)
	WH1107		(E,S)
2	WJ1111	Knob (Level Control)	
3	WJ1133	Knob (Power SW.)	
4	WJ1134P	Knob (Tape Moni.)	
	< Front Panel Ass'y >		
5	WA1190	Front Panel	
6	WQ1028	Shading Cloth	
7	WE1089	Protector (Power SW. Knob)	
8	WE1086	Protector (Tape Moni. Knob)	
9	UG1025	Bonnet	(J,S,E)
10	UE1104	Bottom Plate	(J,S,E)
11	WN0007	Foot	(J,S,E)
9'	WB1079	Wooden Case	(U)
11'	WN1019	Foot	(U)
12	UC1156	Rear Panel	(J,E,S)
	UC1182		(U)
13	AT5027	Terminal (Out, Input)	
14	AT5027	Terminal (Rec Out, Moni.)	
15	TD0196	LED (Power Indicator)	
16	TD0196	LED (Over Level Indicator)	
	< Packing Material >		
	XA1246A	Carton	(U)
	XA1246B	"	(E,S,J)
	XB1038A	Pad (Left & Right)	(U)
	XB1038B	"	(E,S,J)
	< Power Cond >		
17	BK0023	240 V. Only With Pulg	
	BK0036	240 V. Only With Out Pulg	
	BK0022	220 V. Only (Class-1)	
	BK0018	120 V. Only (U.S.A. CANADA)	
	BK0015	100 V. Only (JAPAN)	
	< Bushing, Power Cord >		
	BU0039	For Power Cord BK0023, 36	
	BU0033	For Power Cord BK0022, 18, 15	

S: 220V or 240V

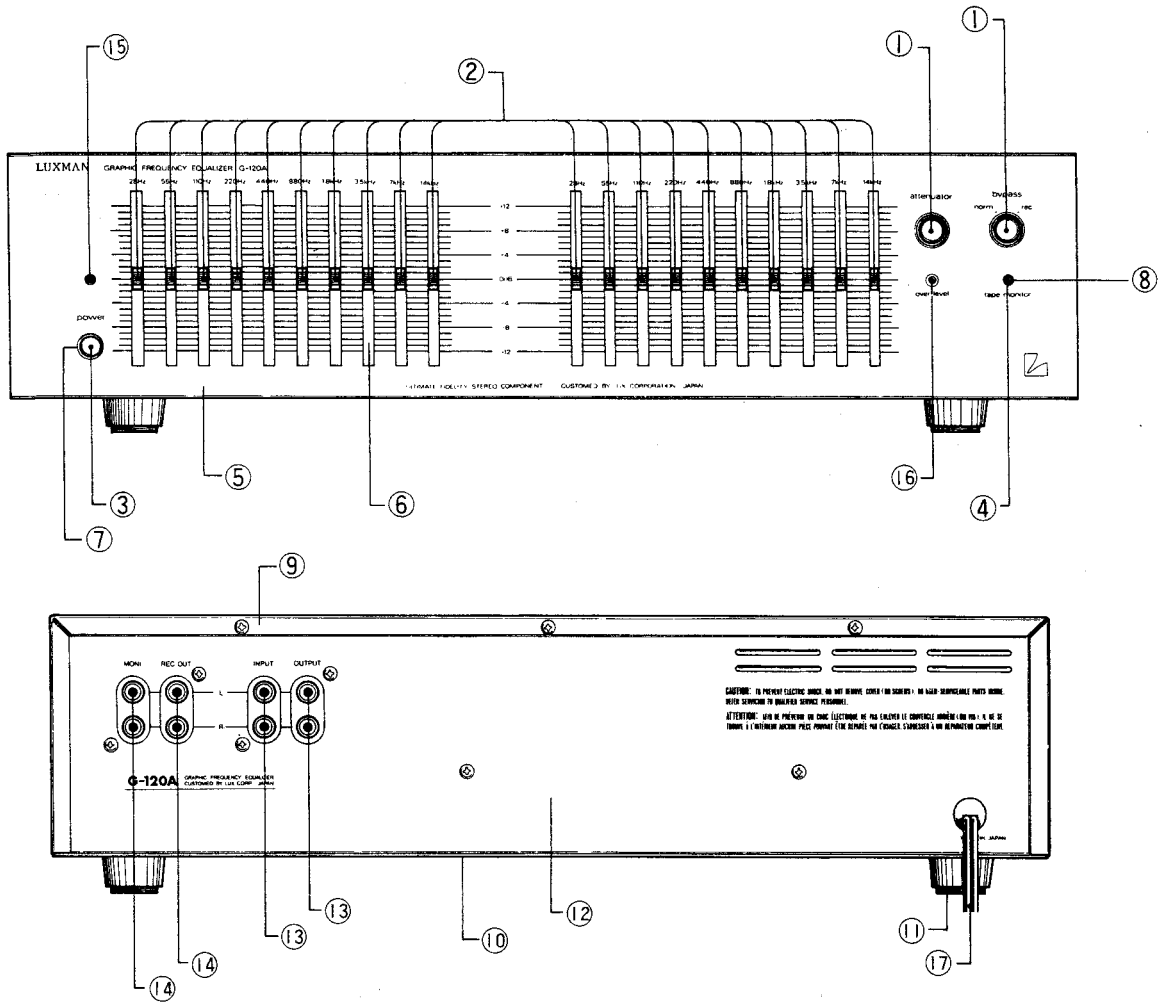
U: 120V only (U.S.A. and Canada)

J: 100V only (Japan)

E: 220V (with Line Voltage Selector)

REPLACEMENT PARTS ---- (Cosmetic)

FRONT & REAR VIEW

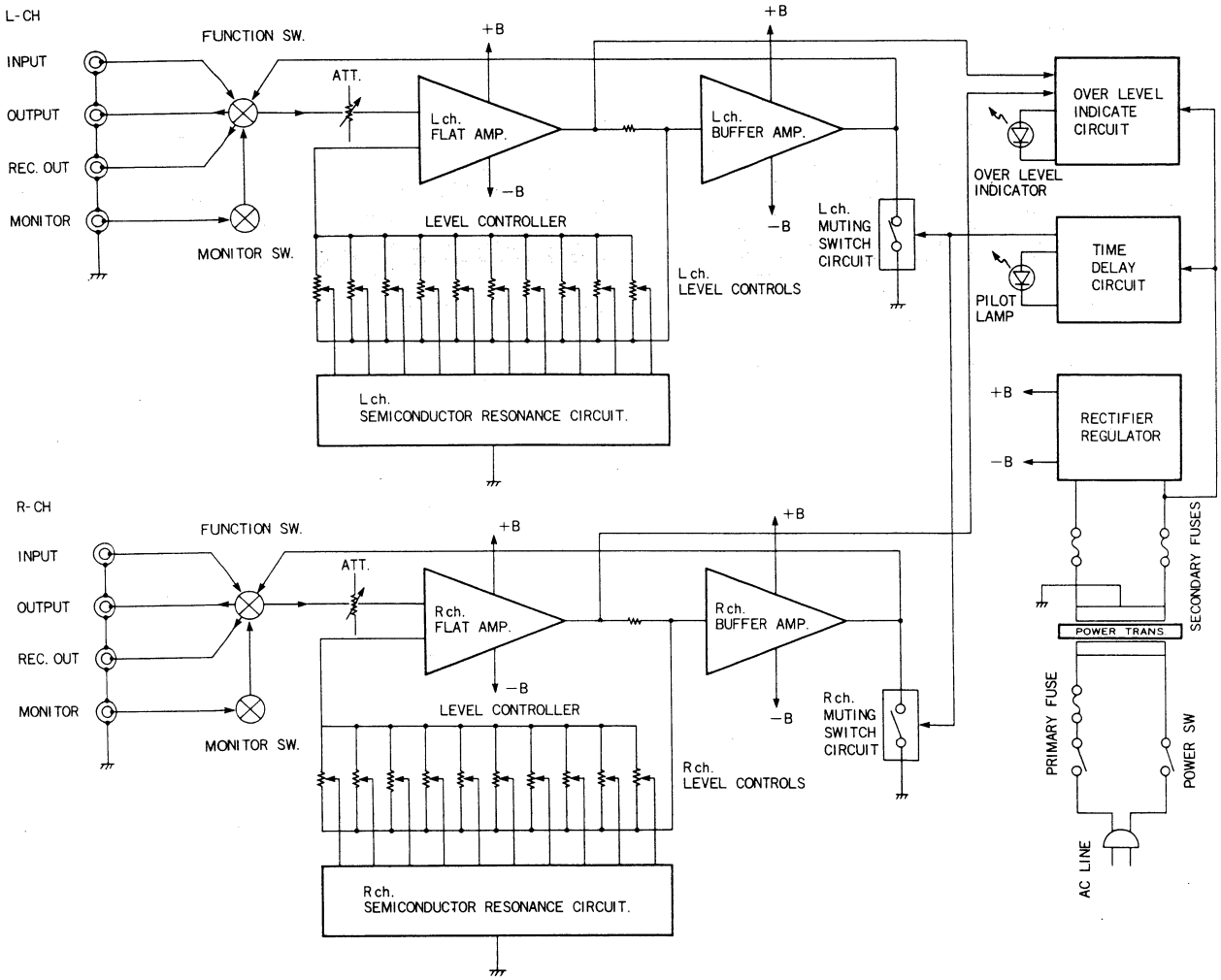


Parts List --- (Cometic)

REF. NO.	STOCK NO.	DESCRIPTION
	< Variable Resistor >	
VR001~10	RV0250	Level cont.100Kx2
VR011	RV0251	Input Att. 100Kx2
S101	< Function Switch Ass'y >	
	SS0133	Switch, Remote
	SZ0137	Wire,(Remote Switch)
	SR0137	Rotary
S102	< Tape Monitor SW. Ass'y >	
	SP0153	Switch, Push
	UZ1197	Shaft

REF. NO.	STOCK NO.	DESCRIPTION
S001	< Power Switch >	
	UZ1196	Shaft
	SP0090	SDG 5P 502-5A[S]
	SP0090	SDG 5P 502-5A[E]
	SP0032	SDG 1PTV5ULCSA[U]
	SP0037	SDG Spoo 1-10A[J]
	< Power Transformer >	
	PT2429	P2429 (220, 240V) (S)
	PT2430	P2430 (100~240V) (E)
	PT2428	P2428 (120V) (U)
	PT2427	P2427 (100V) (J)

BLOCK DIAGRAM



Alignment Procedure

Output Level Adjustment

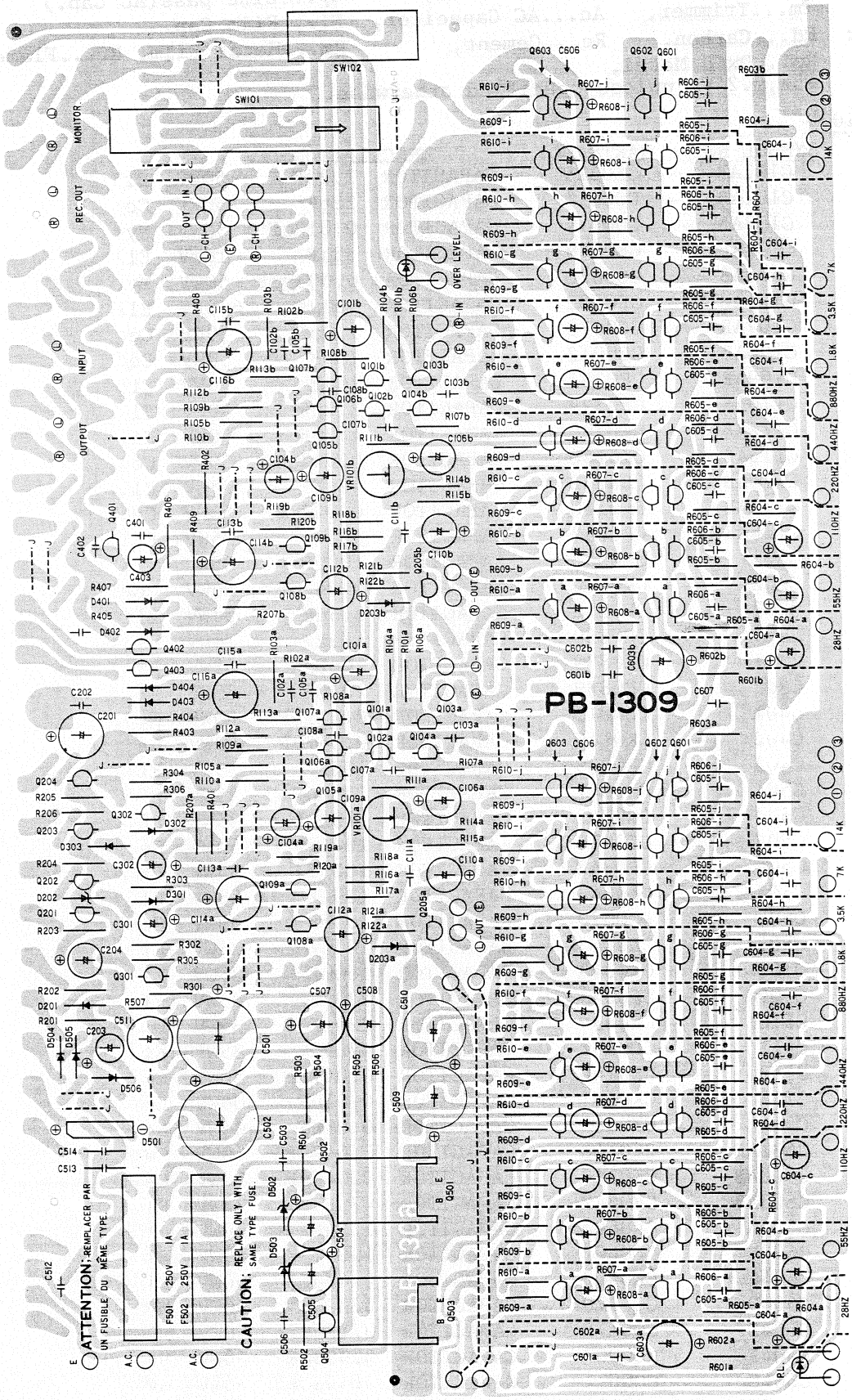
(1) Feed Sine Wave; 1K Hz 1 Volt RMS. to input terminal, and connect AC voltage meter (V.T.V.M.) at output terminal.

(2) Adjust VR 101a and VR 101b on PB-1309 to get output level of 1 volt RMS.

(3) Adjust both channels in same manner.

P.C. BOARD

PB-1309



Replacement Parts List ---(P.C.B)

REMARKS

Capacitor: My...Mylar, El...Electrolitic, St...Styrol, Ce...Ceramic
Mi...Mica, Ta...Tantalum, Lp...Line pass(AC Cap.)
Tm...Trimmer, Ac...AC Capacitor, Fi...Film Cap.
Resistor: Rd...Carbon, Rc...Cement, Rm...Metal Film, Rf...Flame proof
Ro...Oxid Metal,
±5%,0.25W, unless specified otherwise.

PB-1039

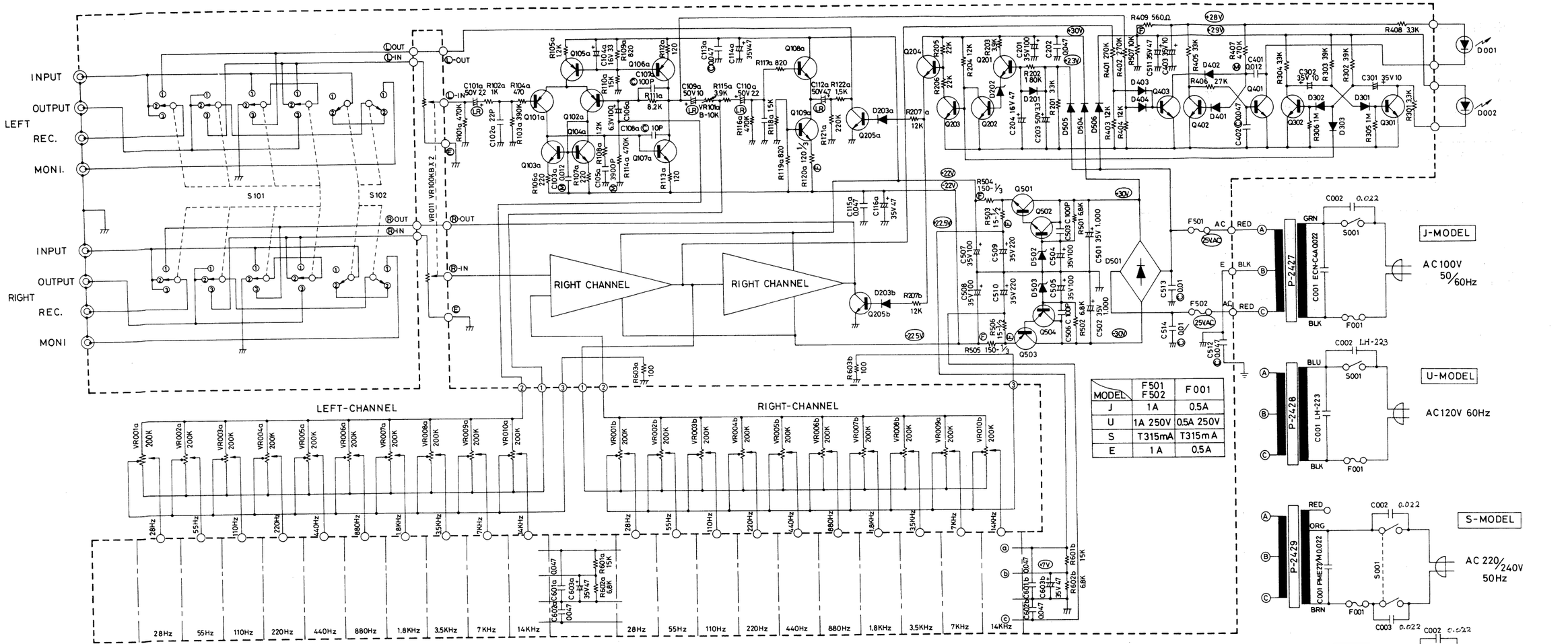
SYMBOL NO.	PARTS NO.	DESCRIPTION			
C101AB	CE0329	CAPACITOR	2.2μF	50WV	El
C102AB	CC0014	CAPACITOR	22pF	50WV	Ce
C103AB	CQ0015	CAPACITOR	0.012μF	50WV	My
C104AB	CE0819	CAPACITOR	33μF	16WV	El
C105AB	CQ0020	CAPACITOR	0.0039μF	50WV	My
C106AB	CE0802	CAPACITOR	100μF	6.3WV	El
C107AB	CC0070	CAPACITOR	100pF	50WV	Ce
C108AB	CC0012	CAPACITOR	10pF	50WV	Ce
C109AB	CE0331	CAPACITOR	10μF	50WV	El
C110AB	CE0329	CAPACITOR	2.2μF	50WV	El
C112AB	CE0330	CAPACITOR	4.7μF	50WV	El
C113AB	CK0140	CAPACITOR	0.047μF	50WV	Ce
C114AB	CE0842	CAPACITOR	47μF	35WV	El
C115AB	CK0140	CAPACITOR	0.047μF	50WV	Ce
C116AB	CE0842	CAPACITOR	47μF	35WV	El
C201	CE0843	CAPACITOR	100μF	35WV	El
C202	CK0140	CAPACITOR	0.047μF	50WV	Ce
C203	CE0852	CAPACITOR	3.3μF	50WV	El
C204	CE0820	CAPACITOR	47μF	16WV	El
C301	CE0839	CAPACITOR	10μF	35WV	El
C302	CE0839	CAPACITOR	10μF	35WV	El
C401	CQ0015	CAPACITOR	0.012μF	50WV	My
C402	CK0140	CAPACITOR	0.047μF	50WV	Ce
C403	CE0839	CAPACITOR	10μF	35WV	EL
C501	CE0847	CAPACITOR	1000μF	35WV	EL
C502	CE0847	CAPACITOR	1000μF	35WV	EL
C503	CC0070	CAPACITOR	100pF	50WV	Ce
C504	CE0843	CAPACITOR	100μF	35WV	EL
C505	CE0843	CAPACITOR	100μF	35WV	El
C506	CC0070	CAPACITOR	100pF	50WV	Ce
C507	CE0843	CAPACITOR	100μF	35WV	El
C508	CE0843	CAPACITOR	100μF	35WV	El
C509	CE0844	CAPACITOR	220μF	35WV	El
C510	CE0844	CAPACITOR	220μF	35WV	El
C511	CE0842	CAPACITOR	47μF	35WV	El
C512	CK0140	CAPACITOR	0.047μF	50WV	Ce
C513	CK0203	CAPACITOR	0.01μF	500WV	Ce
C514	CK0203	CAPACITOR	0.01μF	500WV	Ce
C601AB	CK0140	CAPACITOR	0.047μF	50WV	Ce
C602AB	CK0140	CAPACITOR	0.047μF	50WV	Ce
C603AB	CE0842	CAPACITOR	47μF	35WV	El
C604A	CE0608	CAPACITOR	2.2μF	50WV	El
C604B	CE0607	CAPACITOR	1μF	50WV	El
C604C	CE0609	CAPACITOR	0.47μF	50WV	El
C604D	CQ0370	CAPACITOR	0.27μF	50WV	My
C604E	CQ0178	CAPACITOR	0.12μF	50WV	My
C604F	CQ0007	CAPACITOR	0.068μF	50WV	My
C604G	CQ0011	CAPACITOR	0.033μF	50WV	My
C604H	CQ0157	CAPACITOR	0.018μF	50WV	My

SYMBOL NO.	PARTS NO.	DESCRIPTION			
C604I	CQ0017	CAPACITOR	0.0082μF	50WV	My
C604J	CQ0020	CAPACITOR	0.0039μF	50WV	My
C605A	CQ0004	CAPACITOR	0.15μF	50WV	My
C605B	CQ0007	CAPACITOR	0.068μF	50WV	My
C605C	CQ0010	CAPACITOR	0.039μF	50WV	My
C605D	CQ0014	CAPACITOR	0.015μF	50WV	My
C605E	CQ0016	CAPACITOR	0.01μF	50WV	My
C605F	CQ0020	CAPACITOR	0.0039μF	50WV	My
C605G	CQ0028	CAPACITOR	0.0018μF	50WV	My
C605H	CQ0026	CAPACITOR	0.001μF	50WV	My
C605I	CQ0170	CAPACITOR	470pF	50WV	St
C605J	CQ0066	CAPACITOR	270pF	50WV	St
C606A	CE0853	CAPACITOR	4.7μF	50WV	El
C606B	CE0853	CAPACITOR	4.7μF	50WV	El
C606C	CE0853	CAPACITOR	4.7μF	50WV	El
C606D	CE0853	CAPACITOR	4.7μF	50WV	El
C606E	CE0853	CAPACITOR	4.7μF	50WV	El
C606F	CE0853	CAPACITOR	4.7μF	50WV	El
C606G	CE0853	CAPACITOR	4.7μF	50WV	El
C606H	CE0853	CAPACITOR	4.7μF	50WV	El
C606I	CE0853	CAPACITOR	4.7μF	50WV	El
C606J	CE0853	CAPACITOR	4.7μF	50WV	El
D201	TD0197	DIODE	US1070		
D202	TD0024	DIODE ZENER	WZ081	8.1V	
D203AB	TD0197	DIODE	US1070		
D301	TD0197	DIODE	US1070		
D302	TD0197	DIODE	US1070		
D303	TD0197	DIODE	US1070		
D401	TD0197	DIODE	US1070		
D402	TD0018	DIODE GE	1K188FM-1		
D403	TD0197	DIODE	US1070		
D404	TD0197	DIODE	US1070		
D501	TD0142	DIODE SI	S1VB20		
D502	TD0036	DIODE ZENER	WZ260	26V	
D503	TD0036	DIODE ZENER	WZ260	26V	
D504	TD0002	DIODE	IN4002		
D505	TD0002	DIODE	IN4002		
D506	TD0002	DIODE	IN4002		
Q101AB	TR0314	TRANSISTOR	2SA999		
Q102AB	TR0314	TRANSISTOR	2SA999		
Q103AB	TR0198	TRANSISTOR	2SC1815		
Q104AB	TR0198	TRANSISTOR	2SC1815		
Q105	TR0087	TRANSISTOR	2SA1015		
Q106	TR0087	TRANSISTOR	2SA1015		
Q107AB	TR0198	TRANSISTOR	2SC1815		
Q108AB	TR0198	TRANSISTOR	2SC1815		
Q109AB	TR0198	TRANSISTOR	2SC1815		
Q201	TR0198	TRANSISTOR	2SC1815		
Q202	TR0198	TRANSISTOR	2SC1815		
Q203	TR0198	TRANSISTOR	2SC1815		
Q204	TR0087	TRANSISTOR	2SA1015		
Q205AB	TR0198	TRANSISTOR	2SC1815		
Q301	TR0198	TRANSISTOR	2SC1815		
Q302	TR0198	TRANSISTOR	2SC1815		
Q401	TR0198	TRANSISTOR	2SC1815		
Q402	TR0198	TRANSISTOR	2SC1815		

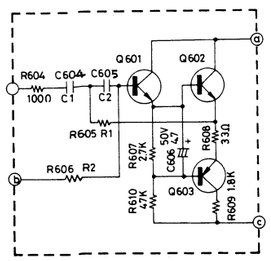
SYMBOL NO.	PARTS NO.	DESCRIPTION	
Q403	TR0198	TRANSISTOR	2SC1815
Q501	TR0121	TRANSISTOR	2SC1626
Q501	BE1054	HEAT SINK	1054
Q501	US1029N	STAND	1029N
Q502	TR0198	TRANSISTOR	2SC1815
Q503	TR0198	TRANSISTOR	2SC1815
Q503	BE1054	HEAT SINK	1054
Q503	US1029N	STAND	1029N
Q504	TR0087	TRANSISTOR	2SA1015
Q601A	TR0313	TRANSISTOR	2SC732 TM
Q601B	TR0313	TRANSISTOR	2SC732 TM
Q601C	TR0313	TRANSISTOR	2SC732 TM
Q601D	TR0313	TRANSISTOR	2SC732 TM
Q601E	TR0313	TRANSISTOR	2SC732 TM
Q601F	TR0313	TRANSISTOR	2SC732 TM
Q601G	TR0313	TRANSISTOR	2SC732 TM
Q601H	TR0313	TRANSISTOR	2SC732 TM
Q6011	TR0313	TRANSISTOR	2SC732 TM
Q601J	TR0313	TRANSISTOR	2SC732 TM
Q602A	TR0198	TRANSISTOR	2SC1815
Q602B	TR0198	TRANSISTOR	2SC1815
Q602C	TR0198	TRANSISTOR	2SC1815
Q602D	TR0198	TRANSISTOR	2SC1815
Q602E	TR0198	TRANSISTOR	2SC1815
Q602F	TR0198	TRANSISTOR	2SC1815
Q602G	TR0198	TRANSISTOR	2SC1815
Q602H	TR0198	TRANSISTOR	2SC1815
Q602I	TR0198	TRANSISTOR	2SC1815
Q602J	TR0198	TRANSISTOR	2SC1815
Q603A	TR0087	TRANSISTOR	2SA1015
Q603B	TR0087	TRANSISTOR	2SA1015
Q603C	TR0087	TRANSISTOR	2SA1015
Q603D	TR0087	TRANSISTOR	2SA1015
Q603E	TR0087	TRANSISTOR	2SA1015
Q603F	TR0087	TRANSISTOR	2SA1015
Q603G	TR0087	TRANSISTOR	2SA1015
Q603H	TR0087	TRANSISTOR	2SA1015
Q603I	TR0087	TRANSISTOR	2SA1015
Q603J	TR0087	TRANSISTOR	2SA1015
R101AB	RB0436	RESISTOR	470K OHM
R102AB	RB0372	RESISTOR	1K OHM
R103AB	RB0434	RESISTOR	390K OHM
R104AB	RB0364	RESISTOR	470 OHM
R105AB	RB0374	RESISTOR	1.2K OHM
R106AB	RB0356	RESISTOR	220 OHM
R106AB	RB0370	RESISTOR	820 OHM
R107AB	RB0356	RESISTOR	220 OHM
R108AB	RB0374	RESISTOR	1.2K OHM
R110AB	RB0400	RESISTOR	15K OHM
R111AB	RB0394	RESISTOR	8.2K OHM
R112AB	RB0350	RESISTOR	120 OHM
R113AB	RB0350	RESISTOR	120 OHM
R114AB	RB0436	RESISTOR	470K OHM
R115AB	RB0386	RESISTOR	3.9K OHM
R116AB	RB0436	RESISTOR	470K OHM
R117AB	RB0370	RESISTOR	820 OHM

SYMBOL NO.	PARTS NO.	DESCRIPTION	
R118AB	RB0400	RESISTOR	15K OHM
R119AB	RB0370	RESISTOR	820 OHM
R120AB	RS1232	RESISTOR	120 OHM
R121AB	RB0428	RESISTOR	220K OHM
R122AB	RB0376	RESISTOR	1.5K OHM
R201	RB0384	RESISTOR	3.3K OHM
R202	RB0426	RESISTOR	180K OHM
R203	RB0386	RESISTOR	3.9K OHM
R204	RB0398	RESISTOR	12K OHM
R205	RB0404	RESISTOR	22K OHM
R206	RB0404	RESISTOR	22K OHM
R207AB	RB0398	RESISTOR	12K OHM
R301	RB0384	RESISTOR	3.3K OHM
R302	RB0410	RESISTOR	39K OHM
R303	RB0410	RESISTOR	39K OHM
R304	RB0384	RESISTOR	3.3K OHM
R305	RB0444	RESISTOR	1M OHM
R306	RB0444	RESISTOR	1M OHM
R401	RB0430	RESISTOR	270K OHM
R402	RB0430	RESISTOR	270K OHM
R403	RB0398	RESISTOR	12K OHM
R404	RB0398	RESISTOR	12K OHM
R405	RB0408	RESISTOR	33K OHM
R406	RB0406	RESISTOR	27K OHM
R407	RB0436	RESISTOR	470K OHM
R408	RB0384	RESISTOR	3.3K OHM
R409	RS1299	RESISTOR	560 OHM 0.33W +/-5% Rf
R501	RB0392	RESISTOR	6.8K OHM
R502	RB0392	RESISTOR	6.8K OHM
R503	RS2502	RESISTOR	15 OHM 0.5W +/-5% Ro
R504	RS1284	RESISTOR	150 OHM 0.33W +/-5% Rf
R505	RS1284	RESISTOR	150 OHM 0.33W +/-5% Rf
R506	RS2502	RESISTOR	15 OHM 0.5W +/-5% Ro
R507	RB0396	RESISTOR	10K OHM
R601AB	RB0400	RESISTOR	15K OHM
R602AB	RB0392	RESISTOR	6.8K OHM
R603AB	RB0348	RESISTOR	100 OHM
R604A	RB0348	RESISTOR	100 OHM
R604B	RB0348	RESISTOR	100 OHM
R604C	RB0348	RESISTOR	100 OHM
R604D	RB0348	RESISTOR	100 OHM
R604E	RB0348	RESISTOR	100 OHM
R604F	RB0348	RESISTOR	100 OHM
R604G	RB0348	RESISTOR	100 OHM
R604H	RB0348	RESISTOR	100 OHM
R604I	RB0348	RESISTOR	100 OHM
R604J	RB0348	RESISTOR	100 OHM
R605A	RB0372	RESISTOR	1K OHM
R605B	RB0374	RESISTOR	1.2K OHM
R605C	RB0374	RESISTOR	1.2K OHM
R605D	RB0374	RESISTOR	1.2K OHM
R605E	RB0374	RESISTOR	1.2K OHM
R605F	RB0374	RESISTOR	1.2K OHM
R605G	RB0374	RESISTOR	1.2K OHM
R605H	RB0374	RESISTOR	1.2K OHM

SYMBOL NO.	PARTS NO.	DESCRIPTION
R605I	RB0374	RESISTOR 1.2K OHM
R605J	RB0374	RESISTOR 1.2K OHM
R606A	RB0420	RESISTOR 100K OHM
R606C	RB0420	RESISTOR 100K OHM
R606D	RB0421	RESISTOR 110K OHM
R606E	RB0419	RESISTOR 91K OHM
R606F	RB0420	RESISTOR 100K OHM
R606G	RB0421	RESISTOR 110K OHM
R606H	RB0420	RESISTOR 100K OHM
R606I	RB0421	RESISTOR 110K OHM
R606J	RB0420	RESISTOR 100K OHM
R607A	RB0382	RESISTOR 2.7K OHM
R607B	RB0382	RESISTOR 2.7K OHM
R607C	RB0382	RESISTOR 2.7K OHM
R607D	RB0382	RESISTOR 2.7K OHM
R607E	RB0382	RESISTOR 2.7K OHM
R607F	RB0382	RESISTOR 2.7K OHM
R607G	RB0382	RESISTOR 2.7K OHM
R607H	RB0382	RESISTOR 2.7K OHM
R607I	RB0382	RESISTOR 2.7K OHM
R607J	RB0382	RESISTOR 2.7K OHM
R608A	RB0336	RESISTOR 33 OHM
R608B	RB0336	RESISTOR 33 OHM
R608C	RB0336	RESISTOR 33 OHM
R608D	RB0336	RESISTOR 33 OHM
R608E	RB0336	RESISTOR 33 OHM
R608F	RB0336	RESISTOR 33 OHM
R608G	RB0336	RESISTOR 33 OHM
R608H	RB0336	RESISTOR 33 OHM
R608I	RB0336	RESISTOR 33 OHM
R608J	RB0336	RESISTOR 33 OHM
R609A	RB0378	RESISTOR 1.8K OHM
R609B	RB0378	RESISTOR 1.8K OHM
R609C	RB0378	RESISTOR 1.8K OHM
R609D	RB0378	RESISTOR 1.8K OHM
R609E	RB0378	RESISTOR 1.8K OHM
R609F	RB0378	RESISTOR 1.8K OHM
R609G	RB0378	RESISTOR 1.8K OHM
R609H	RB0378	RESISTOR 1.8K OHM
R609I	RB0378	RESISTOR 1.8K OHM
R609J	RB0378	RESISTOR 1.8K OHM
R610A	RB0412	RESISTOR 47K OHM
R610B	RB0412	RESISTOR 47K OHM
R610C	RB0412	RESISTOR 47K OHM
R610D	RB0412	RESISTOR 47K OHM
R610E	RB0412	RESISTOR 47K OHM
R610F	RB0412	RESISTOR 47K OHM
R610G	RB0412	RESISTOR 47K OHM
R610H	RB0412	RESISTOR 47K OHM
R610I	RB0412	RESISTOR 47K OHM
R610J	RB0412	RESISTOR 47K OHM
S101	SS0133	SWITSCH SLIDE 8-3
S102	SP0153	SWITCH PUSH 4-2
VR101A	RT0117	SEMI FIXED RESISTOR 100K OHM B
VR101B	RT0117	SEMI FIXED RESISTOR 100K OHM B



MODEL	F501 F502	F001
J	1A	0.5A
U	1A 250V	0.5A 250V
S	T315mA	T315mA
E	1A	0.5A



f (Hz)	R1 (Ω)	R2 (Ω)	C1 (F)	C2 (F)
28	1K	100K	(EL) 2.2μ	(M) 0.15μ
55	1.2K	100K	(EL) 10μ	(M) 0.063μ
110	1.2K	100K	(EL) 0.47μ	(M) 0.039μ
220	1.2K	110K	(M) 0.27μ	(M) 0.015μ
440	1.2K	91K	(M) 0.12μ	(M) 0.01μ
880	1.2K	100K	(M) 0.068μ	(M) 3900P
1.8K	1.2K	110K	(M) 0.033μ	(M) 1800P
3.5K	1.2K	100K	(M) 0.018μ	(M) 1000P
7K	1.2K	110K	(M) 8200P	(S) 470P
14K	1.2K	100K	(M) 3900P	(S) 270P

Q101 Q102 ---------- 2SA999
Q103 Q104 Q107 Q108 Q109 Q201 Q202 Q203 Q205 Q301 Q302 Q401 Q402 Q403 Q502 Q602 ---------- 2SC1815
Q105 Q106 Q204 Q504 Q603 ---------- 2SA1015
Q601 ---------- 2SC732TM
Q501 ---------- 2SC1626
Q503 ---------- 2SA816
D201 D203 D301 D302 D303 D401 D403 D404 ---------- US1070

D202 ---------- WZ081
D402 ---------- 1K188
D504 D505 D506 ---------- 1N4002
D502 D503 ---------- WZ260
D501 ---------- S1VB20
Ⓒ : Ceramic Cap.
Ⓜ : Mylor Film Cap.
Ⓢ : Stirol Film Cap.
(EL) :
(EU) :

S101 ① REC. ② PASS ③ NORMAL
S102 ① MONITOR ② SOURCE
VR001 ~ VR010 LEVEL CONTROL
VR011 ATT.
D011 OVER LEVEL IND.
D002 P.L.

NOTES.
1 UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHM 1/4 WATT, ALL CAPACITORS ARE IN MICRO FARAD.
2 TRANSISTORS AND DIODES MAY BE REPLACED WITH ANY TYPE HAVING COMPARABLE RATINGS.
3 DUE TO CONTINUED IMPROVEMENTS LUX RESERVE THE RIGHT TO ALTER THE CIRCUIT OR SPECIFICATION.

G-120A

SPECIFICATIONS

Output Voltage:		typically 1V, max. 5V (at flat position)
T.H.D.:		not more than 0.01% (output 1V, 20Hz - 20kHz, flat)
I.M.D.:		no more than 0.01% (output 1V, 60Hz : 7kHz = 4 : 1, flat)
Input Sensitivity:		1V
Input Impedance:		65k ohms
Frequency Response:		10 Hz - 100,000Hz (within −1.5dB at flat position)
Signal-to-Noise Ratio:		better than 110dB (at flat position, IHF-A weighted, input short-circuited)
Equalizer Center Frequency:		28Hz, 55Hz, 110Hz, 220Hz, 440Hz, 880Hz, 1.8kHz, 3.5kHz, 7kHz, 14kHz.
Maximum Variable Amount:		± 12dB
Bandwidth:		Q ≒ 2.3
Channel Separation:		better than −80dB (1kHz)
Residual Noise:		below 0.02mV (at flat position)
Power Consumption:		20W
Additional Features:		Function Switch (normal, bypass, rec.), Monitor Switch, Input Attenuator, Over-level Indicator.
Dimensions:	metal cabinet;	438(W) x 270(D) x 110(H) mm (17-1/4" x 10-5/8" x 4-5/16")
	wooden case;	465(W) x 290(D) x 122(H) mm (18-5/16" x 11-7/16" x 4-13/16")
Weight:	metal cabinet;	Net 5.2kgs (11.4 lbs.) Gross 6.5kgs (14.3 lbs.)
	wooden case;	Net 4.9kgs (10.8 lbs.) Gross 6.2kgs (13.6 lbs.)

Specifications and appearance design subject to change without notice.